

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

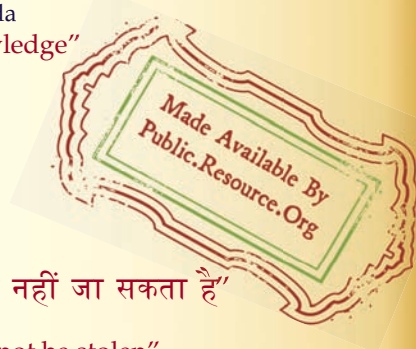
IS 1006 (1984): Arrowroot Starch [FAD 16: Foodgrains, Starches and Ready to Eat Foods]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



Indian Standard
SPECIFICATION FOR
ARROWROOT STARCH
(*Second Revision*)

UDC 664.271



© Copyright 1984

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR ARROWROOT STARCH

(*Second Revision*)

Edible Starches and Starch Products Sectional Committee, AFDC 33

Chairman

SHRI D. S. CHADHA

Representing

Central Committee for Food Standards (Ministry
of Health and Family Welfare), New Delhi

Members

SMT DEBI MUKHERJEE (<i>Alternate to</i> Shri D. S. Chadha)	
DR K. R. BHATTACHARYA	Central Food Technological Research Institute (CSIR), Mysore
DR R. N. TARANATHAN (<i>Alternate</i>)	
DR S. BOSE	National Sugar Institute, Kanpur
DR A. N. SRIVASTAVA (<i>Alternate</i>)	
SHRI V. P. CHADHA	Bharat Starch & Chemicals Limited, New Delhi
SHRI N. D. SINGHAL (<i>Alternate</i>)	
DEPUTY DIRECTOR (FI)	Quartermaster General's Branch, Army Head- quarters, New Delhi
ASSISTANT DIRECTOR (FI) (<i>Alternate</i>)	
SHRI O. P. DHAMIJA	Export Inspection Council of India, Calcutta
SHRI P. K. CHATTERJEE (<i>Alternate</i>)	
DR S. S. GOTHOSKAR	Directorate General of Health Services, New Delhi
SHRI H. R. S. IYENGAR	Indian Confectionery Manufacturer's Association, New Delhi
SHRI L. N. MATHUR (<i>Alternate</i>)	
SHRI R. V. JUNNARKAR	Anil Starch Products Ltd, Ahmadabad
SHRI O. N. PARIKH (<i>Alternate</i>)	
SHRI P. MANSUKHANI	Indian Chemical Manufacturer's Association, Calcutta
SHRI S. M. KHAN (<i>Alternate</i>)	
SHRI MUKESH MALHOTRA	Weikfield Products Co (India) Pvt Ltd, Pune
SHRI PUNEET MALHOTRA (<i>Alternate</i>)	
SHRI B. MUKHERJEE	Ravalgaon Sugar Farm Ltd, Ravalgaon, Manmad
SHRI M. R. BHALERAO (<i>Alternate</i>)	

(*Continued on page 2*)

© Copyright 1984

INDIAN STANDARDS INSTITUTION

This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(Continued from page 1)

Members

SHRI S. R. PALEKAR

SHRI M. G. NERURKAR (Alternate)

SHRI SHANKAR PIMPALE

SHRI M. VENKATARAMAN (Alternate)

SHRI PRAN LAL BHOGILAL

SHRI I. K. SARDANA (Alternate)

SHRI S. RAMASWAMY

BRIG P. J. S. SAGHERA

DR B. K. NANDI (Alternate)

SHRI M. G. SATHE

SHRI R. D. KERAWALLA (Alternate)

DR P. M. SHAH

SHRI V. C. Patel (Alternate)

**SHRI T. PURNANANDAM,
Director (Agri & Food)**

Representing

Corn Products Company (India) Limited, Bombay

Malwadkar Industries, Pune

**All India Starch Manufacturer's Association,
Bombay**

**Directorate General of Technical Development,
New Delhi**

**Technical Standardization Committee (Food-
stuffs), (Ministry of Food and Civil Supplies),
New Delhi**

**Federation of Biscuit Manufacturers of India,
Delhi**

Maize Products, Ahmadabad

Director General, ISI (Ex-officio Member)

Secretary

SHRI S. K. SUD

Senior Deputy Director (Agri & Food), ISI

Indian Standard
SPECIFICATION FOR
ARROWROOT STARCH
(*Second Revision*)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 25 January, 1984, after the draft finalized by the Edible Starches and Starch Products Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Arrowroot starch (commonly known as ' arrowroot ') is obtained in the country from the rhizomes of the plants known as *Maranta arundinacea*. Arrowroot is also derived from the rhizome of *Curcuma augustifolia*. It is chiefly used as an infant and invalid food. To a small extent, it is also employed in the manufacture of biscuits and in making puddings, cakes and sweets.

0.3 While formulating this standard and during subsequent revision the Sectional Committee gave due weightage to the prevailing methods for the manufacture of arrowroot starch and the available data on its composition. Furthermore, due consideration was also given to the relevant rules prescribed by the Government of India under the Prevention of Food Adulteration Act, 1954. Due consideration has also been given to the provision laid down under the standards of Weights and Measures (Packaged Commodities) Rules, 1977. However, this standard is subject to the restrictions imposed under these, wherever applicable.

0.4 In the revised version of this standard, the photomicrograph of arrowroot starch derived from the rhizomes of *Curcuma augustifolia* has also been given. Other important changes made in this revision include increase in limits of moisture, total ash and acid insoluble ash.

0.4.1 During the first revision of this standard, there was considerable discussion regarding the provision of bacteriological limits for arrowroot starch. It was, however, felt that these limits should not be prescribed as arrowroot starch is generally consumed only after boiling its solution. The limit for minimum starch content had also been included at that stage, and the limit of acid insoluble ash had been raised from 0.05 to 0.1 percent.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for arrowroot starch, popularly known as 'arrowroot'.

2. TERMINOLOGY

2.1 For the purpose of this standard, arrowroot starch shall mean the separated and purified starch from the rhizomes of *Maranta arundinacea* or *Curcuma augustifolia* or a mixture of both.

3. REQUIREMENTS

3.1 Description — The material shall be in the form of a fine powder and shall be white or off white in colour. It shall be free from rancidity, adulterants, insect infestation, and from fermented, musty or any other objectionable odour. It shall not contain added sweetening, flavouring or colouring agents or any foreign matter. The material shall be free from dirt and other suspended and extraneous matter.

3.2 Microscopic Appearance — When the material is subjected to microscopic examination as prescribed in 4 of IS : 4706 (Part 1)-1978† the starch granules shall conform to the following descriptions.

- a) The starch prepared from *Maranta arundinacea* shall have granules which are simple and similar to those of potato starch in shape but rather smaller. The hilum may be sometimes centric but more often eccentric and frequently marked by fissures. The granules shall have a characteristic appearance similar to the photomicrograph shown in Fig. 1.
- b) The starch prepared from *Curcuma augustifolia* shall have granules 30 to 60 μm in size and oval, elliptical almost rectangular or rounded, thin in shape. The hilum shall be pinctiform and very eccentric. Striae shall be very distinct. The granules shall have a characteristic appearance similar to the photomicrograph shown in Fig. 2.

*Rules for rounding off numerical values (revised).

†Methods of test for edible starches and starch products: Part 1 Physical methods (first revision).

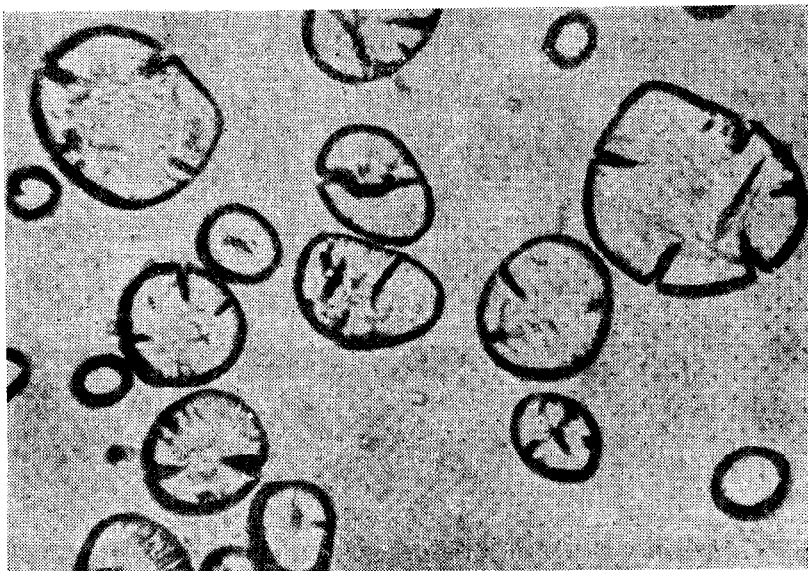


FIG. 1 PHOTOMICROGRAPH OF ARROWROOT STARCH
(*Maranta arundinacea*) ($\times 480$)



FIG. 2 PHOTOMICROGRAPH OF ARROWROOT STARCH
(*Curcuma augustifolia*) ($\times 480$)

3.3 Particle Size — When tested by the method prescribed in 3 of IS : 4706 (Part 1)-1978*, not more than 2 percent by mass of the material shall be retained on 75 μ m IS Sieve and not more than 0.5 percent by mass shall be retained on 150 μ m IS Sieve.

NOTE — In case IS Sieve (conforming to IS : 460 (Part 1)-1978 † are not available, BS Test Sieve 200, ASTM Sieve 200 and Tyler Sieve 200; BS Test Sieve 100 ASTM Sieve 100 and Tyler Sieve 100 which have their apertures within the limits specified for 75 and 150 μ m IS Sieve respectively, may be used.

3.4. Hygienic Conditions — The product shall be processed and packed under hygienic conditions conforming to IS : 2491-1972‡.

3.5 The material shall also comply with the requirements given in Table 1.

TABLE 1 REQUIREMENTS FOR ARROWROOT STARCH

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST REF TO CLAUSE OF IS : 4706 (PART 2) - 1978*
(1)	(2)	(3)	(4)
i)	Moisture percent by mass, <i>Max</i>	14.0	4
ii)	Total ash (on dry basis), percent by mass, <i>Max</i>	0.6	5
iii)	Acid insoluble ash (on dry basis), percent by mass, <i>Max</i>	0.3	8
iv)	Starch (on dry basis), percent by mass, <i>Min</i> (see Note)	98	—
v)	pH of aqueous extract	4.5 to 7.0	13

NOTE — Till the accurate method for estimation of starch is established, the starch content shall be calculated by difference.

*Methods of test for edible starches and starch products : Part 2 Chemical methods.

4. PACKING

4.1 The material shall be packed in clean, sound and dry containers made of such material and of such sizes as agreed to between the purchaser and the vendor.

5. MARKING

5.1 Each container shall be suitably marked so as to give the following information:

a) Name of the material;

*Methods of test for edible starches and starch products: Part 1 Physical methods (*first revision*).

†Specification for test sieves : Part 1 Wire cloth test sieves (*second revision*).

‡Code for hygienic conditions for food processing units (*first revision*).

- b) Name and address of the manufacturer;
- c) Batch or code number;
- d) Net mass; and
- e) Any other requirement as prescribed in the standards of Weights and Measures (Packaged Commodities) Rules, 1977.

5.1.1 Each container may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

6. SAMPLING

6.1 The method of drawing representative samples of the material shall be as given in IS : 4662-1977*.

6.2 Number of Tests and Criteria for Conformity

6.2.1 Starch content and moisture content shall be tested on each of the individual samples and the remaining requirements shall be tested on the composite sample.

6.2.2 The lot shall be declared as conforming to the requirements of the specification if all the test results on individual and composite samples satisfy the relevant specification requirements.

7. TESTS

7.1 The tests shall be carried out as prescribed in the appropriate clauses of the standards specified in 3.2, 3.3 and in col 4 of Table 1.

7.2 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1977†) shall be used in the tests.

NOTE — ' Pure chemicals ' shall mean chemicals that do not contain impurities which affect results of analysis.

*Methods for sampling of starches and starch products (*first revision*).

†Specification for water for general laboratory use (*second revision*).

INDIAN STANDARDS

ON

EDIBLE STARCHES AND STARCH PRODUCTS

IS:

- 873-1974 Liquid glucose (*first revision*)
- 874-1975 Dextrose monohydrate (*second revision*)
- 899-1971 Tapioca sago (*SABOODANA*) (*first revision*)
- 1005-1976 Maize starch (corn flour), edible (*second revision*)
- 1007-1971 Custard powder (*first revision*)
- 1317-1969 Edible tapioca chips (*first revision*)
- 1318-1969 Edible tapioca flour (*first revision*)
- 1319-1983 Edible tapioca starch (*second revision*)
- 3155-1969 *MAKHANNA* products
- 4287-1976 Glossary of terms relating to starch (*first revision*)
- 4706 (Part 1)-1978 Methods of test for edible starches and starch products: Part 1
Physical methods
- 4706 (Part 2)-1978 Method of test for edible starches and starch products: Part 2
Chemical methods
- 8847-1978 Dried glucose syrup
- 9130-1979 Edible spray dried potato flour

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	Unit	Symbol
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	Unit	Symbol	Definition
Force	newton	N	1 N = 1 kg.m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²

INDIAN STANDARDS INSTITUTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 26 60 21, 27 01 31

Telegrams : Manaksanstha

Regional Offices:

		Telephone
Western : Novelty Chambers, Grant Road	BOMBAY 400007	89 65 28
Eastern : 5 Chowringhee Approach	CALCUTTA 700072	27 00 90
Southern : C. I. T. Campus	MADRAS 600113	41 24 42
Northern : B-69, Phase VII	S. A. S. NAGAR (MOHALI) 160051	8 78 26

Branch Offices:

*Pushpak, Nurmohamed Shaikh Marg, Khanpur	AHMADABAD 380001	2 03 91
'F' Block, Unity Bldg, Narasimharaja Square	BANGALORE 550002	22 48 05
Gangotri Complex, Bhadbhada Road, T. T. Nagar	BHOPAL 482003	6 27 16
22E Kalpana Area	BHUBANESHWAR 751014	5 36 27
5-8-56 C. L. N. Gupta Marg	HYDERABAD 500001	22 10 83
R14 Yudhister Marg, C Scheme	JAIPUR 302005	6 98 32
117/418 B Sarvodaya Nagar	KANPUR 208005	4 72 92
Patilputra Industrial Estate	PATNA 800013	6 28 08
Hantex Bldg (2nd Floor), Rly Station Road	TRIVANDRUM 695001	32 27